IN THE CLAIMS

This is a complete and current listing of the claims, marked with status identifiers in parentheses. The following listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently Amended) A method for PCR amplification and detection of nucleotide sequences, comprising ~~the following steps~~:

~~a)~~ using an array of a plurality of microspots forming analytical positions, said microspots ~~comprising~~ including as probe molecule at least one immobilized oligonucleotide which is hybridizable with a target sequence to be identified of a DNA fragment~~,~~;

~~b)~~ applying an analyte solution ~~comprising~~ including PCR reagents and a plurality of target sequences to the microspots in such a way that it completely covers the array~~,~~;

~~c)~~ subjecting the array to a thermocycling process ~~in order~~ to amplify the target sequences; and~~,~~

~~d)~~ detecting hybridization events on probe molecules immobilized at one analytical position with the aid of a microelectrode arrangement.

2. (Currently Amended) The method as claimed in claim 1, ~~characterized~~ wherein~~in that~~ a hydrophilic reaction layer ~~(14)~~ having coupling groups for covalent binding of probe molecules is used.

3. (Currently Amended) The method as claimed in claim 2, wherein ~~characterized in that~~ the reaction layer ~~(14)~~ used is a hydrogel.

4. (Currently Amended) The method as claimed in claim 2~~ or 3~~, wherein~~characterized in that~~ a free-radically crosslinkable hydrogel based on at least one of acrylamide with maleic anhydride and~~/or~~ glycidyl (meth)acrylate as coupling groups is used.

5. (Currently Amended) The method as claimed in ~~any of claims~~claim 1~~ to 4~~, wherein~~characterized in that~~ a biochip including~~comprising~~ a semiconductor layer and an insulating layer~~ (13)~~ connected therewith is used, the side of the insulating layer~~latter~~, which faces away from the semiconductor layer, carrying the electrode arrangement ~~(5)~~ and the reaction layer~~ (14)~~.

6. (Currently Amended) The method as claimed in claim 5, wherein~~characterized in that~~ the semiconductor layer used is a silicon layer~~ (12)~~.

7. (Currently Amended) The method as claimed in claim ~~any of claims~~ 1~~ to 6~~, wherein~~characterized in that~~ an analyte solution is used which includes~~comprises~~ an external primer pair~~, i.e. a primer pair which hybridizes with a target DNA outside a target sequence~~.

8. (Currently Amended) The method as claimed in claim 1~~any of claims 1 to 7~~, wherein~~characterized in that~~ an analyte solution is used which includes~~comprises~~ a plurality of DNA fragments having a different target sequence and a single external primer pair suitable for the amplification of all target sequences.

9. (Currently Amended) The method as claimed in claim ~~any of claims~~ 1~~ to 7~~, wherein~~characterized in that~~ an analyte solution is used which includes~~comprises~~ an external primer acting together with the one strand of at least one DNA

fragment and in that a counter strand is elongated within a reaction layer with the aid of an internal primer~~, i.e. a primer which specifically hybridizes with the target sequence,~~ immobilized there.

10. (Currently Amended) The method as claimed in ~~any of~~ claim~~s~~ 1~~ to 7~~, wherein~~characterized in that~~ an analyte solution is used in which an internal primer pair specifically hybridizing with a target sequence is immobilized in a microspot.

11. (Currently Amended) A device for carrying out the method as claimed in claim 1~~ or in any of claims 2 to 10~~, comprising a biochip having an array of microspots ~~(4)~~ which form analytical positions and which are covered by a hydrophilic reaction layer~~ (14)~~.

12. (Currently Amended) The device as claimed in claim 11, wherein~~characterized in that~~ the biochip with hydrophilic reaction layer ~~(14)~~ is arranged in a housing having an opening for an analyte solution~~ (18)~~.

13. (Currently Amended) The device as claimed in claim 11, wherein ~~characterized in that~~ the biochip contains carriers for the microspots ~~(4)~~ as substrate~~ (2)~~.

14. (Currently Amended) The device as claimed in claim 11, wherein~~characterized in that~~ the substrate ~~(2)~~ consists of a semiconductor material~~, in particular silicon (Si),~~ to which an insulating layer ~~(13)~~ has been applied.

15. (Currently Amended) The device as claimed in claim 11, wherein~~characterized in that~~ the biochip is a prefabricated silicon chip having thin-layer microelectrodes ~~(6a, 7a; 24, 25)~~ implemented therein.

16. (New) The method as claimed in claim 3, wherein a free-radically crosslinkable hydrogel based on at least one of acrylamide with maleic anhydride and glycidyl (meth)acrylate as coupling groups is used.

17. (New) The method as claimed in claim 1, wherein an analyte solution is used which includes a primer pair which hybridizes with a target DNA outside a target sequence.

18. (New) The method as claimed in claim 1, wherein an analyte solution is used which includes an external primer acting together with the one strand of at least one DNA fragment and in that a counter strand is elongated within a reaction layer with the aid of a primer which specifically hybridizes with the target sequence, immobilized there.

19. (New) The device as claimed in claim 11, wherein the substrate consists of silicon, to which an insulating layer has been applied.